

REMARKS

In view of both the amendments presented above and the following discussion, the Applicants submit that none of the claims now pending in the application is anticipated under the provisions of 35 USC § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, the Examiner should telephone Mr. Peter L. Michaelson, Esq. at (732) 542-7800 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Drawings

Upon review of the drawings, as they now stand corrected, the Applicants propose changing the label of block 10 of FIG. 1 from "Personal Agents" to --Personal Assistants-- in order to conform this figure to the amended specification. A red-lined drawing sheet showing this correction is enclosed herewith and for which the Applicants now solicit the Examiner's approval. Upon receipt of that approval in the next communication from the PTO, the Applicants will then submit an appropriately corrected substitute formal drawing sheet in due course.

Status of claims

Claim 5 has been slightly amended to provide additional clarification. No other claims have been amended. No claims have been added or canceled.

Rejection under 35 USC § 102

The Examiner has rejected claims 5-8, as they stood prior to this amendment, under the provisions of 35 USC § 102(b), as being anticipated by the teachings of the Koreeda et al patent (United States patent 5,781,731 issued to H. Koreeda et al on July 14, 1998). Since claim 5 is the only independent claim in the present application, then, to simplify the ensuing argument, the following discussion will principally focus on that claim.

The Applicants submit that claim 5, as it stood prior to this amendment, was not anticipated by the teachings of the Koreeda et al patent. Nevertheless, to clarify the present invention, the Applicants have now slightly amended this claim. As the Examiner will shortly appreciate, the invention as recited in this claim, as it now exists, is clearly not anticipated by the teachings of this applied patent. Hence, this rejection is respectfully traversed.

The presently claimed invention provides an agent-based system where user communication flows through a strict sub-system hierarchy that employs fixed rules of communication and restricted task assignment. Such an organized and rigid hierarchical flow of communication lies

directly contrary to the teachings of the Koreeda et al patent.

The Applicants have recognized, in pages 1 and 2 of their specification, that traditional agent-based systems suffer various drawbacks.

In particular, given that conventional agents maintain mutual contact through a computer network, inter-agent communication tends to impart a significant burden on a network. Furthermore, to implement such communication and other related functionality, such as mutual co-operation with other agents, each agent tends to be functionally rather extensive and, as such, implemented through a complex computer program. Moreover, a particularly problematic and significant drawback, namely a security risk, arises from the fact that the agents tend to share information amongst themselves and are each free to communicate with a variety of different actors (including humans). By virtue of such unrestrained inter-agent communication through which information is typically freely shared amongst different agents, confidential information belonging to or concerning one user may well be provided to another user, thus breaching and possibly destroying the confidentiality of that information.

The present invention advantageously remedies these deficiencies by providing a hierarchical agent-based arrangement that uses fixed rules of communication.

Specifically, a personal assistant is associated with each different user. A 1:1 correspondence exists

between each user and his(her) personal assistant, and each user only communicates with his(her) personal assistant. Each personal assistant interacts with one or more personal service agents solely associated with that particular assistant, and with no other personal service agents. The user does not directly communicate with any of his(her) personal service agents. For that user, the personal service agents perform specific specialized sub-tasks only for and communicate with that user's particular personal assistant. Hence, each personal assistant and personal service agent only operate for its associated user, i.e. on a 1:1 basis, and for no other; though multiple personal service agents may operate for any one personal assistant and there through ultimately for its one associated user.

Each personal service agent also communicates with a coordination processor (also referred in the specification as a "processor part") within a coordinating (processing) sub-system. Inter-agent communication (aside from learning information and/or certain specified task-related information, for which as to the latter prior user permission has been provided) between the personal service agents of different users only occurs through this sub-system.

For example, as shown in FIG. 1 of the present application, the inventive personal agent system may illustratively contain four different personal assistants 11-14. Each of these assistants is only associated with a different corresponding individual user; hence, each personal assistant serves a different user, but only that user. Each user can access his(her) corresponding

assistant through PC 60 (or any of PCs 60' used in a networked environment shown in FIG. 2). As shown, each of these personal assistants interacts with one or two associated personal service agents within environments 30 and 40. In particular, personal assistants 11 and 12 interact with personal service agents 31 and 21, and 22 and 32, respectively; personal assistant 13 interacts just with personal service agent 23 in environment 20, and personal assistant 14 interacts just with personal service agent 34 in environment 30. Each of personal service agents 20, illustratively agents 21-23, may be a personal secretary agent which provides a secretarial function for its associated user; while each of agents 30, such as agents 31-32 and 34, may be a traveling agent which makes travel arrangements for its associated user. Each personal assistant passes on orders from its associated individual user, but no one else, to its associated personal service agent(s) based on the needs of that user and instructs that personal service agent to undertake a corresponding sub-task, i.e., perform a given secretarial task, or arrange a meeting with another user. Because each personal assistant and each personal service agent, by virtue of the fixed and strict social hierarchy there between, do not handle tasks for multiple users, confidential information for one user is not likely to be exchanged with any other user, thus restricting user information flow within the entire personal agent system. This, in turn, significantly heightens security over that provided by traditional agent-based systems. Specifically, each personal assistant and its associated personal service agent(s) do not ordinarily communicate with any other such assistant or agent (aside from, in an modified embodiment of the

invention, sharing learning information or specific user-approved information), but only through a neutral process (coordinating sub-system), such as processing part (coordination processor) 41, which coordinates the actions of all the personal service agents, including information exchange there between, for tasks that ultimately involve multiple users. The coordination processor is the only element that receives and processes the confidential information provided by multiple personal service agents to handle a task, which here is to, e.g., establish an appointment involving multiple users.

Further, since inter-agent communication, within the system, is significantly reduced over that which would occur in traditional agent-based systems, this, in turn, advantageously reduces network traffic and also significantly simplifies the programming of each such agent over that heretofore required in the art.

In contrast, the Koreeda et al patent teaches directly away from use of a fixed social hierarchy.

This patent, to the extent relevant, is directed to a computerized agent-based system for scheduling conferences among various users. As discussed in col. 4, line 14 et seq and col. 8, line 1 et seq -- the latter with reference to FIG. 3 of that patent, the system envisions a plurality of personal agents 800_a, 800_b, 800_c, Each of these agents contains a user interface agent (e.g., user interface agent 820_a for personal agent 800_a), a conference sponsor agent (e.g., conference sponsor agent 830_a for agent 800_a), a schedule management agent (e.g., schedule

management agent 840_a for agent 800_a) and an appointment agent (e.g., appointment agent 850_a for agent 800_a).

As noted in col. 8, line 13 et seq., to support a task of conference scheduling, the system also includes conference room agent 920 which manages utilization conditions of a conference room, accounting agent 930 which processes travel expenses, and personal information agent 910 for searching, in an organization, for a partner then having knowledge and information which a conference sponsor wants to know and for making an appointment with that partner.

In operation and as depicted in FIG. 3 and expressly described in col. 8, line 22 et seq, each of the schedule management agents 840_a, 840_b,... receives a conference scheduling notice message from each of the conference sponsor agents 830_a, 830_b, ... , an appointment request message from each of the appointment agents 850_a, 850_b, ... , and schedule information concerning days off, utilization of flextime, personal affairs and the like, the schedule information being input by each of the users 810_a, 810_b, ... by itself through each of the user interface agents 820_a, 820_b,

An organization agent 860, corresponding to the hierarchy of the organization, processes schedule information provided by the various personal agents to schedule a conference for the various users and so communicates with their personal agents. To do so, a company agent 870 may send schedule information regarding holidays and events set up throughout the company to

schedule management agents 840_a, 840_b, Though the processing performed by conference sponsor agent 830_a to schedule a conference is shown in FIG. 4, that processing is not relevant to the present invention and thus will not be discussed any further.

As the Examiner can readily appreciate from the above-description of the multi-agent methodology taught by the Koreeda et al patent and particularly the inter-agent communication shown in FIG. 3, it should be abundantly clear that agents associated with different users can communicate directly with each other. For example and as explicitly shown, a conference sponsor agent (830_b) and an appointment agent (850_b) for one personal agent (800_b) can communicate directly with a schedule management agent (840_a) of another personal agent (800_a). What this means is simple. There is no apparent restraint on the extent to which confidential user information can be exchanged amongst various agents. This is not surprising given that the Koreeda et al patent is totally oblivious to the fact that certain user information, e.g. schedule information, which its agents might access is confidential to a given user, and to maintain its confidentiality should not be exchanged with agents for other users without express permission of its owner. Given that the patent is completely indifferent to this problem, it should come as no surprise that the patent poses no solution to this problem.

The problem of controlling the flow of unrestrained user information in a multi-agent system, as inherent in the art here typified by the teachings of the Koreeda et al patent, is the exact problem which the

Applicants recognize and solve. As discussed above, the Applicants' inventive solution is to employ a fixed social hierarchy for communication flow in a multi-agent system, with communication between different users only occurring ultimately through a coordination processor with no such flow of information ordinarily occurring between different agents themselves.

While the Examiner opines that the organization agent 860 discussed in col. 8, lines 22-41 is the Applicants' coordinating sub-system, this view is incorrect. Though, as noted above, organization agent 860 does receive information from various personal agents, i.e., for different users, there is no strict social hierarchy taught by the Koreeda et al patent through which information flow involving different users only flows through the organization agent. In fact, as is clearly shown in FIG. 3 and discussed above, inter-agent communication for different users flows outside of agent 860 and can flow directly between the personal agents for multiple users. This lies directly opposite to the fixed, social hierarchy taught by the present Applicants where, in accordance with their invention as now recited in claim 5, all communication between their personal service agents for different users flows only to the coordinating sub-system and not between those agents. Thus, coordinating sub-system 5 functionally differs from the organization agent.

Further, if, as it appears from the present action, the Examiner is viewing the conference sponsor agent, schedule management agent and appointment agent taught by the Koreeda et al patent as equivalent to the

personal service agents (e.g. traveling agents 30 and secretary agents 20) taught by the present Applicants, then a crucial difference exists which the Examiner has failed to appreciate. Specifically, as discussed above, these agents taught by the Koreeda et al patent are able to communicate directly with peer agents within the personal agents for other users. The Applicants' personal service agents can not. Under the Applicants' inventive and claimed approach, no user information, confidential or otherwise, is passed from a personal service agent associated with one user directly to a personal service agent associated with another user -- an approach sharply contrary to that expressly taught by the Koreeda et al patent. Thus, the agents taught by the Koreeda et al patent functionally differ from the personal service agents now taught by the Applicants.

In essence, the Koreeda et al patent teaches a methodology that lies contrary to the presently claimed invention. There are simply no teachings or even just a suggestion, whether explicit or implicit, in this patent of using a fixed, social hierarchy in a multi-agent system, as the Applicants now teach, to restrict the flow of user information through that system.

Claim 5, as it now stands, contains suitable recitations directed to the distinguishing features of the present invention. In particular, this claim recites as follows, with those recitations being shown in a bolded typeface:

"A hierarchically-structured personal agent system within a computer system, the personal agent system comprising:

a personal assistant sub-system having a plurality of personal assistants, each one of said personal assistants being arranged to perform tasks for one different user in a plurality of users;

at least one service agent sub-system comprising a plurality of personal service agents, **each one of said personal service agents being arranged for carrying out a specific sub-task for an associated one of said personal assistants and for only the associated one of said users who is served by said associated one personal assistant;** and

a coordinating sub-system comprising at least one coordination processor for mutual coordination of actions of said personal service agents for different ones of the users;

wherein, in order to restrict flow of user information within the personal agent system, said one user only communicates with said one of the personal assistants, the personal assistants for different ones of the users communicate only through their corresponding ones of the personal service agents, and the personal service agents associated with all of the personal assistants communicate amongst themselves only through the coordinating sub-system." [emphasis added]

Inasmuch as these distinguishing recitations are not identically disclosed by the teachings of the Koreeda et al patent, then this claim is not anticipated by those teachings and hence is patentable there over under the provisions of 35 USC § 102.

Each of dependent claims 6-8 directly depends from claim 5 and recites further distinguishing aspects of the present invention. Consequently, each of these dependent claims is also patentable, under the provisions of 35 USC § 102, over the teachings of the Koreeda et al patent for the same exact reasons set forth above with respect to claim 5.

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This rejection should now be withdrawn.

Conclusion

Consequently, the Applicants believe that all their claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

Respectfully submitted,


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